GLIOMA OF THE RIGHT FRONTAL LOBE OF THE BRAIN.

By WILLIAM C. KRAUSS, M.D.,

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H. S.—Single, aet. thirty-one; height, five feet eight inches; weight, one hundred and fifty-five pounds; occupation, architect and carpenter; complexion, dark.

Family History: Grandparents lived to old age. Parents are living and healthy at the age of fifty-six. There is no history of consumption or syphilis obtainable. One aunt on the mother's side died of cancer.

Early History: He passed through the usual diseases of childhood without any sequelae; grew rapidly and became an expert workman at his trade.

Present History: About a year and a half ago he noticed, while stooping over at his work, a little dizziness which soon passed off. Occasionally he would notice the vertigo when in an upright position, but on account of its transitory character he paid little attention to it. These dizzy spells continued without increasing any in intensity, and without further disturbances until February, 1896, when he began to have dull headaches with periods of exacerbation. The dull pain seemed to encompass the whole head, but during the exacerbation the pain became more acute and intense, and extended from the forehead to the nape of the neck; afterwards it became more intense and more fixed at the occiput, and was more or less continuous, so that he was obliged to discontinue his work (Sept. 20th, 1896.) When the pains were at their acme of intensity he would feel his head drawn backwards.

In May, 1896, while he and his brother were bicycling, they ran into each other, and he was thrown violently to the pavement and received quite an extensive injury over the *left* eye, necessitating several stitches to close the wound. This accident did not seem to affect the headaches to any extent, but to another brother (a physician) seemed the probable cause of the head pains. It may be stated here that the patient was a rather quiet, uncommunicative man, especially in regard to his own feelings and sensations, and up to the time of the injury hardly ever spoke of his head pains. During the following three months he had but five severe spells of head pains.

About September 1st, 1896, he began to have spells of nausea and vomiting, generally in the morning when the stomach was entirely empty. These occurred at first about once a month, but increased in frequency until they occurred almost every other day. The vomited matter always consisted of a watery fluid, which he says had a very pleasant taste. The vomiting came on with a sort of hiccough and never prostrated him. During the summer (1896) the dizziness became more severe, and instead of having a dizzy spell about once a week he would feel dizzy every time he laid down or arose. When he tried to walk after having had one of these spells he staggered for two or three steps, but did not swerve to either side, never fell down, and noticed no other peculiarity about his locomotion. The eyes, he said, felt as if red hot irons were being thrust into them, also at times it seemed as if a white mist were hanging before the eyes; this would clear up and vision would become again good. He stated that his bowels were nearly always regular; that his appetite was variable; that he slept pretty well of late, though formerly he was disturbed by the head pains; that there was no difficulty in urination, no numbness or any other abnormal sensation, and that if it were not for the headaches and dizziness he would be able to work as hard as ever.

Status Praesens. Sept. 26th, 1896.

Mental condition: Conversation with him shows that the mental faculties are intact, although he talks very little on any subject unless specially interrogated. He is in good humor, answers all questions promptly, and does not seem to take his sickness and enforced idleness much to heart. He reads the papers, does copying and makes himself useful about his brother's pharmacy. His actions and demeanor here show no change from his normal healthy condition, so his brother informs me.

His face is emaciated; the face lines are prominent; the complexion is dark, dull and ashen; the expression is somewhat apathetic. A very faint scar is seen over the left eye, the result of the bicycle accident in May, 1896; the scalp reveals no scars, no tender spots and no prominence of the sutures.

Percussion of the skull reveals no tenderness.

Eyes: The pupils are widely dilated, with no apparent difference between the two, and react to light and accommodation. The muscles of the orbits functionate normally in all directions. Ophthalmoscopically, a double optic neuritis is seen, and is, perhaps, a little more pronounced in the right disc. Hemorrhages have taken place about the fundus. Vision is subnormal, with no history of double vision.

The tongue and uvula show no deviation. No disturbance of audition, olfaction or gustation is found. The tendon reflexes, as well as the muscular, are normal. Sensation of the face, body and extremities is unimpaired. Dynamometric test gives the following results: Right hand, 140; left hand, 145; right leg, 182; left leg, 175.

Pulse shows eighty to eighty-five beats per minute and is regular and uniform. Urine contains no traces of sugar or albumin.

The persistent headaches, with dizziness, nausea, vomiting, and above all, choked discs, suggested a cerebral growth of some kind situated in some "silent" portion of the brain or else so small as not to call forth any localizing symptoms. Although he strenuously denied having had syphilis, it was deemed prudent to put him on mercury and iodide, and to watch the effect of treatment, and to be prepared for the appearance of focal symptoms, so that if advisable surgical measures could be undertaken.

I saw him repeatedly after this, and apparently a change for the better was going on, as he complained less of his head pains; the vomiting and dizziness seemed to have lessened in frequency and severity, and he appeared more active and interested in his environment. This improvement was also observed by his brother, the physician, and the mercury and iodide were given with renewed vigor.

On October 17th, 1896, he rceived a letter from his former employer asking him if he were able to work again, and if so to write immediately. This pleased him greatly, and he could not understand why he was not able to resume work, inasmuch as he was feeling so much better. The optic neuritis, however, remained stationary, and was regarded more as an index of the condition in the brain than the subjective symptoms.

Between Oct. 17th and Dec. 8th, he thought he was so much improved that he refused to take any more medicine and did not come to see me. He also absented himself from his brother's office, and it was with some difficulty that he was persuaded to come this day.

On Dec. 8th, 1896, he reported as follows: He said his headaches had nearly disappeared; that he had not vomited in two weeks; that the dizziness was also disappearing; that the appetite was good and the bowels regular; that he slept well and "felt more like getting around." The papillitis of the left eye was receding, so that the outlines of the nerve were distinguishable The right eye showed small hemorrhages about the optic disc which was much swollen. Vision of right eye was 20/30, left eye 15/30. Dynamometric test: Right hand, 145; left hand, 145; right leg, 180; left leg, 175.

Sensation, audition, gustation and olfaction were not disturbed. Pulse was eighty, regular and uniform. His mind was clear, although he acted as if somewhat depressed and seemed to fall into a state of mental hebetude when no questions were asked him.

Believing him somewhat improved, it was decided to continue the anti-syphilitics up to the point of intoxication, especially as no localizing symptoms had appeared. It seemed from the subjective symptoms, the examination of the eyes and strength of the extremities that the growth was, perhaps, diminishing in size.

Soon thereafter reports came to me through his father and brother that the pains were becoming more intense, and were somewhat more paroxysmal, and that during these attacks he would say nothing, and even refused to answer questions, and was in a dazed condition. Pulse during a paroxysm ranged from forty-five to fifty-five.

On December 25th, he took dinner with his brother's family and seemed to be in the best of health and spirits. He played with the children, laughed, talked freely and enjoyed himself very much. The next day, Dec. 26th, he came to my office and denied having had any severe attack, and said the pains were in no way comparable to the pains he formerly endured. He also reported feeling pretty well, although his expression was not as cheerful as on former visits. Dynamometric test showed some diminution of power of the left hand. It was as follows: Right hand, 145; left hand, 135.

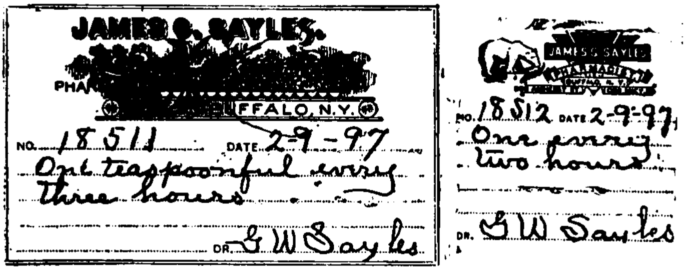
From this time on I received word from the brother that the paroxysms of pain were becoming so intense that he would be obliged to go to bed, and that in his opinion the patient was failing rather than improving. After one of these paroxysms (Feb. 1st, 1897), he urinated in the soap dish and into the bureau drawer, and was unable to find his way down stairs. This was the only time when the patient appeared at all irrational, and he recovered from this condition in twenty to thirty minutes. During the intervals he would stay at the pharmacy writing labels, reading, and doing light work, and was possessed of all his mental faculties.

On February 4th, 1897, accompanied by his brother, he appeared at my office, and on first glance it was apparent that a change for the worse had taken place. The face was pale, ashen, dull and expressionless, the pupils of the eyes were widely dilated and his strength was evidently declining. He remembered nothing about the urination episode, nor of the several paroxysms, but knew about everything that had transpired during the time when his head was free from pain. He answered all questions intelligently, but, as on a former visit, lapsed into a dreamy, listless condition when left alone.

I was firmly resolved to locate the growth to-day if possible, and made a thorough examination.

Again the head was not sensitive to percussion; the eyes were in practically the same condition as before; audition, olfaction, gustation, and the various forms of sensation were likewise unaltered. Dynamometric test resulted as follows: Right hand, 135; left hand, 120; right leg, 170; left leg, 165.

There was no history of spasms or of periods of paresis of the extremities, while the face, tongue and uvula functionated normally. The pulse was eighty, regular and uniform. I informed the brother that in all probability the growth was not located in the parietal, temporal or occipital lobes, nor at the base, and was not affecting the basal ganglia, and that only by exclusion could it be located in one of the frontal lobes. And yet, even if here, it had not so far called forth any of the mental disturbances often met with in disease of the frontal area. Whether it was on the right or left side was also difficult to determine, and if on the left side, certainly did not affect the caudal part of the third, or of the second convolution near the Rolandic area. It did not affect the centres of motor speech and writing, as neither aphasia nor agraphia was present. If the tumor were located on the right side of the brain it might have invaded certain areas whose functions are as yet undetermined, these "silent" areas being more extensive on the right side than on the left, and causing no definite symptoms when destroyed, as far as we know; or the cortex at the base of the brain, as that of the orbital convolutions, might have been diseased, and no recognizable symptoms have been present. This was, however, mere speculation, and the frontal lobes were thought to be the seat of the growth more than any of the other areas whose functions are unknown. The patient had several very severe attacks of head pain during the next few days and an unusually severe paroxysm on Feb. 10th, 1897, necessitating heroic doses of morphia. Following this attack he declined rapidly and died on the same day, Feb. 10th, 1897, at ten o'clock, P. M.



JAMES C. SAYLES.
PHA
FFALO, N.Y.
NO. 18511 DATE 2-9-97
One teaspoonful every
three hours
DR. G W Sayles

JAMES C. SAYLES
NO. 18512 DATE 2-9-97
One every
two hours
DR. G W Sayles

FIG. I.

On Feb. 9th he was at the pharmacy copying labels, a sample of which is here presented. He had not changed any since Feb. 4th, either physically or mentally, and no new symptoms had presented themselves. During the day he played whist, had on the boxing gloves, read, laughed, and felt better than for a month past.

The autopsy was made by Dr. Sayles and myself on Feb. 11th, 1897. The frontal bone over the left eye showed no traces of any injury which the bicycle accident might have inflicted. The calvarium was of the usual thickness, and not adherent to the dura. The dura was not injected, and over the right frontal lobe fluctuated and showed an area of depression as compared with that of the left side. It was soft superficially to the touch, but dense and hard under pressure. The left lobe felt firm and resistant, and it was evident that the right lobe was the seat of disease. On removing the dura a large cyst, about the size of a walnut, the ectal wall of which was evidently the pia, was found in the right lobe at the surface. The cystic contents were collected in a bottle, and the collapsed walls brought into view a large, dense, firm tumor. The brain was removed and placed in a five per cent. solution of formalin for hardening, so as to facilitate a careful anatomical and pathological examination of the affected lobe.

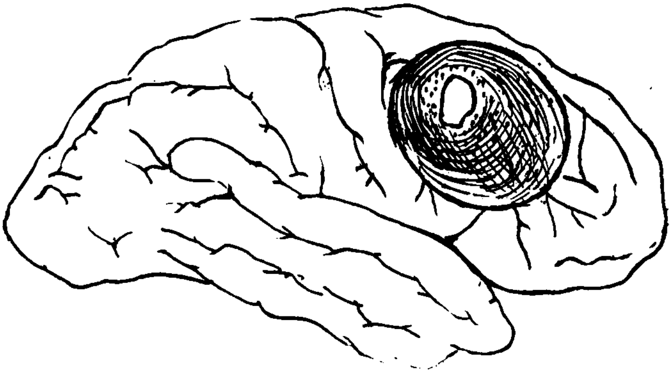


FIG. II

The tumor occupied the middle and caudal portion of the first, second and third frontal convolutions, extending as far caudad as the ascending frontal convolution, thus occupying about one-half of the convex surface of the frontal lobe. Entad, the tumor extended to the lateral ventricle.

This cystic opening communicated with the lateral ventricle. Histologically the growth appeared to be a glioma with considerable connective tissue stroma present.

While the brain was in process of hardening an area of softening was felt over the angular convolution of the *left* lobe, and thinking that the formalin had not infiltrated the brain thoroughly, and that this portion was beginning to soften and break down, I cut into this region and found a cystic cavity about the size of a pigeon's egg. The fluid was similar to that which had escaped from the cyst in connection with the glioma. The cystic fluid from the tumor, which was about two ounces, was of a pale straw color, rich in albumin, and under the microscope revealed no traces of echinococci.

Two important questions arise in the study of this case: First, were the symptoms sufficient to warrant a positive focal diagnosis, and secondly, was it a mistake to postpone and eventually deprive the patient of the benefits of an operation.

It is now almost universally conceded that the right frontal and right temporal lobes contain no distinctive focal centres, and they are known as the "silent" or "latent" lobes or areas, in contradistinction to the corresponding lobes on the left side, which are the centres of motor speech and writing, and of hearing. The frontal lobes, perhaps equally, except for motor speech and writing, are supposed to be the seat of the intelligence and the psychical attributes which characterize mankind. Experiments on animals and clinical study have thus far failed to show just how much responsibility each lobe assumes in preserving the proper mental balance of the individual, and when the posterior portion of the second and third frontal convolutions of the left side are not involved, it is almost impossible to say, from the subjective symptoms, which lobe is the seat of disease. When along with marked mental decadence, aphasia or agraphia is present with the symptoms denoting brain tumor, then it is safe to localize the disease at least in the left frontal area, but still unsafe to say whether or not the right frontal area is also involved.

Inasmuch as the left side of the brain, especially the frontal and temporal lobes, contain important centres not present on the right side, may not the centres presiding over reason, memory, intelligence, or the higher psychical states be more localized in the left frontal lobe close to the centres of speech and writing, which are the two great channels through which the intelligence of the being is made manifest to the external world? The close proximity of the centres of speech and the centres presiding over those organs (articulatory) by means of which speech is possible; also the proximity of the centres of writing and those presiding over the movements of the fingers by which writing is possible, might suggest a like proximity of the centres of intelligence, and those centres through which the intelligence of the individual is expressed, namely, of speech and writing; all these are located in the left frontal lobe of the brain.

The symptoms presented by my patient would certainly tend to corroborate this view, and also to prove quite conclusively that the writing centre is not situated in the right frontal region. In my opinion, the areas presiding over the functions just mentioned enjoy much closer communion than we have as yet pretended to grant them. The same is true of the centres presiding over motion and sensation. In the motor areas, for instance, the layer of large cortical ganglion cells is interested in the movements of the various extremities, while the layer of small ganglion cells in the same cortical area could very properly preside over sensation. This view is not so very extraordinary, inasmuch as cases are on record of paralysis of motion and sensation where the lesion was found wholly in the motor areas. In like manner the centres of intelligence, inhibition and judgment might be located in the smaller ganglion cells of the whole frontal lobe of the left hemisphere, the centres of speech and writing occupying localized areas in the deeper layer of ganglion cells.

In fifty cases of tumor of the prefrontal area analyzed by Williamson,[1] the mental symptoms were generally well marked, and in many cases were the most prominent and earliest symptoms. His results are as follows:

There was a condition of mental decadence with a dull mental state, a loss of power of attention, a loss of memory, a loss of spontaneity; the patient took no notice of his surroundings and slept during the greater portion of the day, or was semi-comatose in thirty-two of the cases.

There was loss of memory, mental failure, but the patient was cheerful in six cases.

The patient was suspicious and suffered from delusions, which were occasionally violent in one case.

The patient was irritable and violent in one case.

The patient was generally asleep and irritable when awake in two cases.

The patient was ambitious, excitable, and had loss of memory in one case.

There was slowness of mental processes, and the patient was simple and childish in one case.

There were mental anxiety, childishness, hallucinations, suicidal tendencies in one case.

The mental condition was not stated in five cases.

Seventeen of these lesions involved the right lobe, twenty-two the left, and eleven both lobes.

Ferrier[2] states the symptoms of disease of the frontal lobes as follows: Mental inactivity, forgetfulness, lack of judgment, decided change in character, irritability of temper and unusual stupidity, an inability to concentrate the attention, to think connectedly and continuously, to learn easily, to exercise self-control, and lastly, a state approaching mild dementia without delusions, in which the patient may become dirty and disregard all restraints of decency.

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[1] Brain, 1896, p. 346.

[2] Ferrier, quoted from Starr, Dercum's System of Nervous Diseases.

Starr[3] says: "A decided mental change in character and disposition, a mental apathy and a mental somnolence must be regarded as a local sign of frontal lobe disease."

Mills[4] says that in cases of disease of the prefrontal region, mental disturbances of a peculiar character occur, such as mental slowness and uncertainty, want of attention and control, and impairment of judgment and reason; closely studied the inhibitory influence of the brain both upon psychical and physical action is found to be diminished.

It must also be borne in mind that a brain tumor affecting any portion or lobe of the cerebrum causes mental changes, which are, however, not as pronounced as when the frontal lobe is affected.

In an analysis of fifty-six cases of brain tumor, I found mental indifference or apathy present in thirty-five cases, not present in one case, and not mentioned in twenty cases.

In an analysis of forty-two cases of brain abscess or cyst, I found mental symptoms present in twenty-seven cases, absent in four cases, and not mentioned in eleven.

Oppenheim[5] considers mental apathy or somnolence of great importance in cases of brain tumor. The patient appears to be in a dreamy, sleepy state, and falls asleep while eating, or is even filthy in his habits, owing, of course, to the mental hebetude. The symptoms here narrated do not include those produced by pressure of the growth upon the neighboring areas as, for instance, the motor regions.

The mental condition of our patient was not such as to attract particular attention, until, perhaps, after the urination episode. It might then have been decided that the frontal area was involved, although the mental peculiarity at this time could have been attributable to the severe paroxysm of pain. That none of the marked mental states found in prefrontal disease, such as those observed by different writers were present, was evident to us, and the symptoms which were observed were not different from those I have seen in cases where the tumor was located in the parietal or temporal lobe. It was, therefore, only by exclusion that a problematical diagnosis was possible, and then it was not of sufficient accuracy to warrant a surgical operation.

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[3] Starr, Dercum's System of Nervous Diseases.

[4] Mills, Dercum's System of Nervous Diseases.

[5] Lehrbuch der Nervenkrankheiten.

In Williamson's collection of fifty cases, four cases of abscess were all suitable for surgical interference. One case, MacEwen's, was operated on with success. Seven cases of tumor of the prefrontal lobes were so suitable and of such a moderate size that they could have been easily removed. In twenty other cases a tumor was removed; in one case successfully (Durante), in the others unsuccessfully.

Had an operation been undertaken the removal of so large a portion of the brain and the drainage of the cerebrospinal fluid would doubtless have produced a fatal termination soon after the completion of the operation. If it had been successfully removed the cyst in the left angular gyrus would still have been present and would have produced the same general symptoms, but perhaps not as severe. It would seem, therefore, that here, at least, was a frontal lobe tumor which would not have permitted a successful operative procedure.

DU TRAITEMENT DES NEURASTHENIES GRAVES PAR LA PSYCHOTHERAPIE (The Treatment of Grave Neurasthenia by Psychotherapy). Dr. P. Valentine. (Bull. Gén. de Thér., Nov. 15, '96.)

It has already been proved by many authors that the mental treatment of neurasthenic subjects is most beneficial, especially in rebellious cases, which, as is well known, resist the usual methods. The author, considering the morbid psychical condition as the pathogenic element of the disorder, advocates treatment by hypnotic suggestion as the most reliable means, and enumerates three cases approaching the degenerative type of neurasthenia successfully treated. He concludes that psychotherapy in any form, with or without hypnosis, is the most successful method in obstinate cases, and that hypnotic suggestion never aggravates the cerebral disorder, but, on the contrary, invariably inspires the patients with stronger will power, more judgment and application. MACALESTER.

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